

PX Series

Digital temperature controller

- Fuzzy function, PID auto tuning
- 3 zone PID / Group PID 3 kinds
- Programmable function
(1 pattern / 10 segments)
- Heating / Cooling control,
Heater Break Alarm (HBA)
- 3 types of set value selection by the contact input(DI)
- Communication function (RS485 / 422)
- Remote input function (4 – 20 mA DC)



● Suffix code

Model		Code	Description
PX	<input type="checkbox"/> -	<input type="checkbox"/> <input type="checkbox"/>	Multi input/output temperature controller
Dimension	7		72(W) X 72(H) mm
	9		96(W) X 96(H) mm
Control type		0	Universal type (possible to select either the reverse operation or direct operation)
		1	Heating/cooling control (synchronous control output)
Option		0	NONE
		1	PX7 : RS485/422, OUT2, REM (Remote input : 4 – 20 mA DC) PX9 : RS485/422, HBA 2 Contact, REM (Remote input : 4 – 20 mA DC)
		2	RS485/422, OUT2, HBA 1 Contact
		3	Contact input (DI), OUT2, HBA 1 Contact

(Cautious) 1) PX9 can be applied with only option number 1

2) PX7 can be applied with all of the option choices.

3) PX7- (Heating/Cooling control) need consulting when using relay for cooling control output.

Specification

Input

Thermocouple	K, J, E, T, R, B, S, L, N, U, W, PL2
RTD input	KPt 100 Ω , Pt 100 Ω
DC rated voltage	1 – 5 V DC, –10 ~ 20 mV, 0 – 100 mV, 4 – 20 mA (attach 250 Ω external resistance)
Input sampling time	250 ms (with remote selection : 500 ms)
Input display resolution	Usually less than the decimal points of range
Input impedance	Min 1 M Ω (thermocouple, DC voltage input)
Allowable signal source resistance	Max 250 Ω (thermocouple input), Max 2 k Ω (DC voltage input)
Allowable wiring resistance	Max 10 Ω (RTD input)
Allowable input voltage	± 10 V (thermocouple, RTD, DC voltage : mV), ± 20 V (DC voltage : V)
Scaling	–1999 ~ 9999 (SL–H > SL–L)
Cold junction compensation error	± 1.5 $^{\circ}\text{C}$ (15 ~ 35 $^{\circ}\text{C}$), ± 2.0 $^{\circ}\text{C}$ (0 ~ 50 $^{\circ}\text{C}$)
Input signal break detection	UP Scale/DOWN Scale selection (thermocouple input). UP Scale (RTD input)

Performance

Display accuracy	± 0.1 % of FS ± 1 Digit. thermocouple (K, J, E, T, L, U, W, PL2) ± 0.15 % of FS ± 1 Digit. thermocouple (R, B, S) ± 0.2 % of FS ± 1 Digit. thermocouple (N) ± 0.1 % of FS ± 1 Digit. RTD (KPt100 Ω , Pt100 Ω), DC voltage
External power supply	24 V DC. 20 mA max. (Cannot be used when using retransmission output)
Insulation resistance	Min 20 M Ω (500 V DC) 1st terminal–2nd terminal–between the earth terminal)
Dielectric strength	2,300 V AC, 50 / 60 Hz, 1minute (1st terminal–2nd terminal–between the earth terminal) 1,500 V AC, 50 / 60 Hz, 1minute (2nd terminal–between the F.G)

Control function and output

Control type	PID auto tuning
Control action	a) temporal selection of reverse action (heating) and direct action (cooling) (due to the selection of parameter) b) heating/cooling synchronous control
Range setting	Same as the input range chart
Contact input (DI)	Select 3 kinds of set temperatures that had been set in advance as an external contact.
Auto tuning 2 types	Target value/low target value auto tuning selection
Proportional band	0.1 ~ 999.9 % (heating/cooling type : 0.0 ~ 999.9 %)
Integral time	OFF, 1 ~ 6,000 sec
Differential time	OFF, 1 ~ 6,000 sec
ARW(Anti Reset Windup)	Auto, 50.0 ~ 200.0 %(proportional band)
ON/OFF control	Select the output types by parameter

PID selection	Zone PID/group PID selection
Control mode selection	Local/Programmable remote input selection
Manual reset	Possible to set as manual reset when integral time is OFF
Output with input break	Set an amount of output when input breaks
Regular type hysteresis	0.0 ~ 100.0 % of FS (ON/OFF control output, alarm output, HBA output)
Heating/cooling type hysteresis	0.0 ~ 100.0 % of FS (ON/OFF Control output)
Heating/cooling dead zone setting	-100.0 ~ 50.0 % (proportion band)
Fuzzy operation	Fuzzy operation selection by parameter
Programmable control	Select the control mode by parameter (1pattern/10segments)
Retransmission output	Present value/set value/amount of output/external power supply (24 V DC, 20 mA Max) selection
Retransmission output scaling	Set the present value/set value/amount of output scaling
HBA	Possible to use it with the output of ON/OFF control and time proportional control. (However it cannot be used with the current output and cooling output and detecting is impossible when output ON/OFF time is less than 0.2 sec)
Alarm type	22 types (selection by parameter)

● Output

Control output	Relay	1C contact, 240 V AC, 3 A, 30 V DC 3 A (resistive load) Time resolving power : smaller one between 0.1 % and 10 ms
	SSR	Approx. more than 24V DC (min 600 Ω resistive load) with disconnection, limit within approx. 30 mA Time resolving power : smaller one between 0.1 % and 10 ms
	SCR	4 – 20 mA DC (resistive load less than 600 Ω) Accuracy : ± 0.3 % of FS (range 4–20 mA) Time resolving power : approx. 3,000
Alarm output	Temperature alarm (relay)	2 X 1a contact (PX7). 3 X 1a contact (PX9) 240 V AC, 3 A, 30 V DC 3 A (resistive load)
	HBA (relay)	Measurement current range : 1 – 50 A AC (resolving power : 0.5 A, ±5 % of FS ±1 Digit) (Cautious) when using the cooling output as relay, alarm output is decreased with 1 contact C.T type for HBA : model CTL-6-S
Retransmission output	RET	4 – 20 mA DC (resistive load less than 600 Ω) Accuracy : ±0.3 % of FS (range 4 – 20 mA) Resolving power : approx. 3,000



● Output composition (multi output)

Regular type	Output selection (OT)	OUT1		OUT2	
		Relay output	SSR / SCR (current output)	SSR / current output / Retransmission output(RET)	
PX9-0 □	0	Relay(ON/OFF control)		RET	
PX7-0 □	1		SSR		

※ PX7 Transfer output is optional

Heating/ cooling type	Output selection (OT)	Heating side(OUT1)		Cooling side(OUT2)	
		Relay output	SSR / SCR	Relay output	SSR / SCR / RET
PX9-1 □ PX7-1 □	4		SSR		SSR
	5		SCR		SSR
	6	Relay	RET		SSR
	7		SSR		SCR
	8		SCR		SCR
	9	Relay	RET		SCR (4 – 20 mA DC)
	10		SSR	AL3	RET
	11		SCR	AL3	RET
	12	Relay	–	AL3	RET

General specification

Power supply voltage	100 – 240 V AC 50 / 60 Hz
Voltage fluctuation	±10 % of power supply voltage
Power consumption	10 VA max.
Ambient temperature	0 ~ 50 °C
Ambient humidity	35 ~ 85 % RH (without dew condensation)
Storage temperature	-25 ~ 70 °C
Vibration resistance	10 – 55 Hz, Peak amplitude 0.75 for 2 mins each in 3 axis direction
Shock resistance	300 ㎃, 3 times each in 3 axes direction
Weight	Approx. 472 g(PX9), approx. 344 g(PX7)



Input signal and measurement range

Input signal	Number	Input types	Range (°C)	Accuracy
Thermocouple (TC)	1	K	-200 ~ 1370 *2	±0.1 % of FS ±1 digit
	2	K	-199.9 ~ 999.9 *2	
	3	J	-199.9 ~ 999.9 *2	
	4	E	-199.9 ~ 999.9 *2	
	5	T	-199.9 ~ 400.0 *2	
	6	R	0 ~ 1700 *2	±0.15 % of FS ±1 digit
	7	B	0 ~ 1800 *1	
	8	S	0 ~ 1700	±0.1 % of FS ±1 digit
	9	L	-199.9 ~ 900.0 *2	
	10	N	-200 ~ 1300	
	11	U	-199.9 ~ 400.0 *2	±0.2 % of FS ±1 digit
	12	W	0 ~ 2300	
	13	PL2	0 ~ 1390	
RTD	20	Pt100 Ω	-199.9 ~ 500.0 *3	± 0.1 % of FS ± 1 digit
	21	Pt100 Ω	-199.9 ~ 640.0 *3	
DC voltage (V DC / mV DC)	30	1 – 5 V	Scaling set (-1999 ~ 9999)	± 0.1 % of FS ± 1 digit
	32	-10 – 20 mV		
	33	0 – 100 mV		
DC Current	30※	4 – 20 mA		

*1 : 0 ~ 400 °C range : ±5 % of FS ±1 digit

*2 : Max 0 °C : ±0.2 % of FS ±1 digit

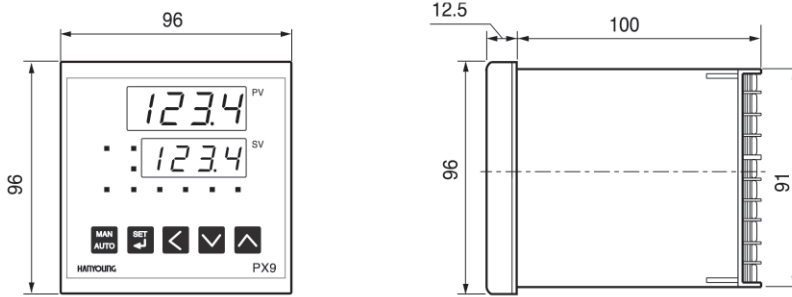
*3 : -150.0 ~ 150.0 range : ±0.2 % of FS ±1 digit

※ When using 4 – 20 mA current input, please attach 0.1 % of 250 Ω resistance to both input signal

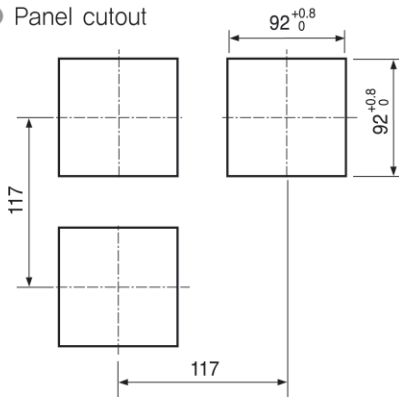
Dimension and panel cutout (unit : mm)

PX9

● Dimension

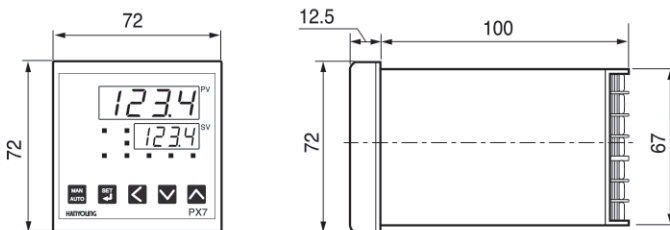


● Panel cutout

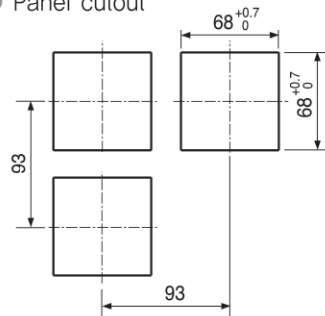


PX7

● Dimension

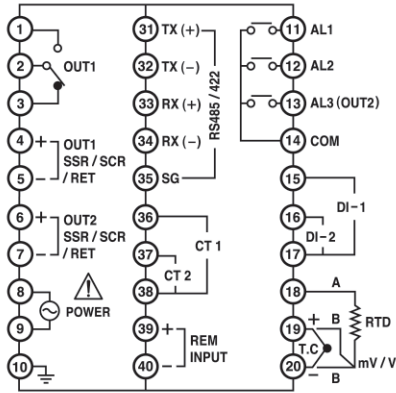


● Panel cutout



● Connection diagram

● PX9 (96 × 96)



● PX7 (72 × 72)

